

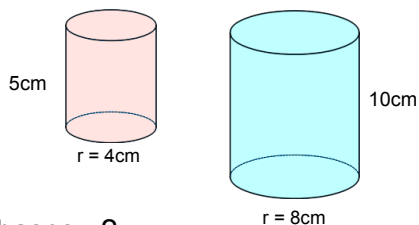
12.7 Explore Similar Solids

Similar solids--same shape, but not necessarily the same size

All spheres are similar.

For other solids:

Bases must be similar and other corresponding lengths must be proportional.

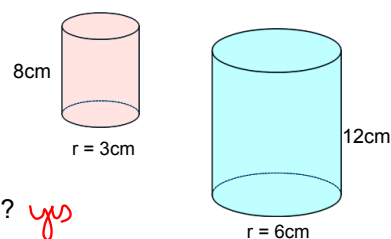


ex 1:

Are the bases ~? *yes*

Scale factor? *1:2*

Are other lengths proportional? *yes*
5:10 = 1:2



ex 2:

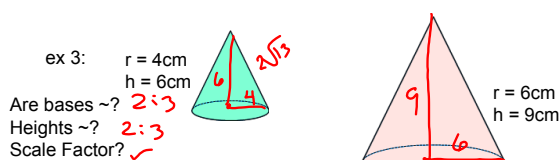
Are the bases ~? *yes*

Scale factor? *1:2*

Are other lengths proportional?

$$\frac{8}{12} \neq \frac{1}{2}$$

Not ~



ex 3: $r = 4\text{cm}$
 $h = 6\text{cm}$

Are bases ~? *2:3*
Heights ~? *2:3*
Scale Factor? *✓*

Find the following for each figure and compare the ratios to scale factor.

	small		large
l	$2\sqrt{13}$	$2:3$	$3\sqrt{13}$
C	8π	$2:3$	12π
B	16π	$4:9$	36π
LA	$8\sqrt{13}\pi$	$4:9$	$18\pi\sqrt{13}$
SA			
V	32π	$8:27$	108π

Theorem 12.13--If the scale factor of 2 ~ solids is $a:b$, then:

1. The ratio of corresponding areas is $a^2:b^2$
2. The ratio of corresponding volumes is $a^3:b^3$

Ex:

The scale factor of 2 cones is 5:6.

What is the ratio of:

P 5:6

LA 25:36

SA 25:36

V 125:216

l 5:6

r 5:6

If the LA of smaller is 100π ,
what is LA for the larger?

$$\frac{25}{36} = \frac{100\pi}{LA}$$

$$2A = 144\pi$$

If the V of smaller is 86.4π ,
what is V for the larger?

$$\frac{125}{216} = \frac{86.4\pi}{V}$$

$$V = 149.3\pi$$

Ex:

Two solid metal cylinders are
similar.

radius of 1st = 10cm

radius of 2nd = 14cm

What is the scale factor? 5:7

If the smaller cylinder weighs 2.5 kg,
how much does the larger one
weigh?

$$\frac{125}{343} = \frac{2.5}{V}$$

$$6.86 \text{ kg}$$

Ex:

Two similar pyramids have LA = 12cm^2 and
LA = 27cm^2

What is the scale factor? 2:3

If the volume of the smaller is $V = 20\text{cm}^3$,
what is the volume for the larger?

Ex:

Two similar prisms have LA = 27cm^2 and LA = 75cm^2 .

What is the scale factor?

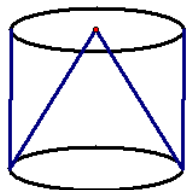
$$\frac{27}{75} = \sqrt{\frac{9}{25}} = \left(\frac{3}{5}\right)$$

If the volume of the smaller is $V = 121.5\text{cm}^3$, what is the
volume for the larger?

$$\frac{27}{125} = \frac{121.5}{V}$$

$$V = 562.5\text{cm}^3$$

Is this cylinder ~ to the cone?

Cylinder Volume = $36\pi \text{ u}^3$
Cone Volume = ?

$$\frac{1}{3}36\pi$$

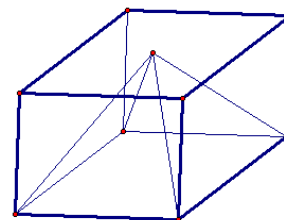
$$V = 12\pi \text{ u}^3$$

$$\text{Cyl. } V = Bh$$

$$\text{Cone } V = \frac{1}{3}Bh$$

Pyramid Volume = 9 u^3
Prism Volume = ?

$$27 \text{ u}^3$$



HW

p850-851

3-6, 8 ,9, 11-15,19